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For: Method for Advanced Imaging in Augmented Reality

- 1 1. A method for using advanced image information to increase the quality of an Augmented
2 Reality (AR) image comprising the image from a camera combined with computer-generated
3 graphics to create an AR display, the method comprising:
 - 4 capturing an image or view of the real world with a camera having a lens;
 - 5 obtaining one or more imaging parameters of the camera and camera lens;
 - 6 determining the position and orientation of the camera;
 - 7 using a computer to render a graphical image representing one or more objects located in
8 the three dimensional space, and rendering said objects such that they are visually consistent
9 with the obtained imaging parameters, position, and orientation of the camera;
 - 10 augmenting the image or view of the real world with the computer generated image; and
11 presenting the augmented image or view to the user.
- 1 2. The method of claim 1 wherein the imaging parameters are provided by the camera
2 electronics via communication to the computer.
- 1 3. The method of claim 1 wherein the imaging parameters are obtained by one or more
2 sensors attached to the camera or lens.
- 1 4. The method of claim 1 wherein the imaging parameters are provided by a combination of
2 camera electronics and sensors attached to the camera or lens.
- 1 5. The method of claim 1 in which the imaging parameters include field of view.
- 1 6. The method of claim 1 in which the imaging parameters include focus.
- 1 7. The method of claim 1 in which the imaging parameters include aperture.
- 1 8. The method of claim 1 in which the imaging parameters include exposure time.
- 1 9. The method of claim 1 in which the imaging parameters include the light sensitivity
2 setting for an electronic imaging element.
- 1 10. The method of claim 1 in which the imaging parameters include a measurement of the
2 light level in the image as seen by the camera.
- 1 11. The method of claim 1 in which at least one imaging parameter is fixed and known prior
2 to capturing the image, and at least one imaging parameter is variable and obtained as it varies.

1 12. The method of claim 1 in which the determining step comprises using a motorized
2 camera mount to provide the orientation of the camera, in conjunction with a previously
3 determined position of the mount.

1 13. The method of claim 1 in which the determining step comprises using an independent
2 3DOF tracking system to determine the orientation of the camera at a known position.

1 14. The method of claim 1 in which the determining step comprises using an independent
2 6DOF tracking system to determine the position and orientation of the camera.

1 15. A method for using advanced image information to increase the quality of an Augmented
2 Reality (AR) image comprising the image from a camera combined with computer-generated
3 graphics to create an AR display, the method comprising:

4 capturing an image or view of the real world with a camera having a lens;
5 obtaining one or more imaging parameters of the camera and camera lens, wherein the
6 imaging parameters are provided by a combination of camera electronics and sensors
7 attached to the camera or lens;

8 determining the position and orientation of the camera, using a motorized camera mount
9 to provide the orientation of the camera, in conjunction with a previously determined position
10 of the mount;

11 using a computer to render a graphical image representing one or more objects located in
12 the three dimensional space, and rendering said objects such that they are visually consistent
13 with the obtained imaging parameters, position, and orientation of the camera;

14 augmenting the image or view of the real world with the computer generated image; and
15 presenting the augmented image or view to the user.